The Swedish Armed Forces
Operational Challenges for Command and Control

Major Ulf Jinnestrand

Swedish Armed Forces Headquarters

Report Documentation Page

Form Approved
OMB No. 0704-0188

Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
FEB 2010	**N/A**	**-**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
The Swedish Armed Forces Operational Challenges for Command and Control	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **Swedish Armed Forces Headquarters**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release, distribution unlimited

13. SUPPLEMENTARY NOTES
See also ADA564685. 2010 Coalition Battle Management Language Workshop (Atelier 2010 sur le langage de gestion du champ de bataille pour les operations en coalition). RTO-MP-MSG-079

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			
unclassified	**unclassified**	**unclassified**	**SAR**	**18**	

The Swedish Armed Forces

SwAF Transformation – issues & goals (1)

Changing Security Environment

- **Globalization, dynamic global environment. New challenges & threats.**
- **Dramatically changed Security Policy**
  - **EU member & NATO partner**
  - ***"From isolation to participation"***
  - ***"Defending Sweden abroad"***

Key issues

From large National, Territorial force ->
Interoperable, Deployable Force ->
Contracted Expeditionary Force

Challenge - transforming the Manning system

Swe Lead nation for EU NBG 11 + NBG 14

SwAF Transformation – issues & goals (2)

Background – Society and Technology changing

- **Changing Societies and rapidly developing Technology**
- **Sweden**
  - **Advanced parts of the SwAF, for example data-links within the Air Force since 1970-ies**
  - **Defence-, IT- and Telecomm industry**

Key issues

- **Joint Force**
- **Networked Force**
- **New strategies for:**
  - **Procurement**
  - **Research & Development**

- Overall - Building interoperability capacity through permissions, authorisation, processes, materiel, methods, exercises and more

- New interoperable capabilities within the C4I area as Link 16, Link 11, Link 22, Beyond Line of Sight, Have Quick, Battleforce Email, Identification Friend or Fool

Multinational Experimentation (MNE) Series

MN LOE 1: November 2001 (AUS, DEU, GBR, USA)
⇨Technical Distributed Collaboration
(South Pacific Vignettes)

MN LOE 2: February 2003 (added CAN and NATO)
⇨Multinational Information Sharing
(Pacific Rim Vignettes)

MNE 3: February 2004 (added FRA)
⇨Effects-Based Planning
(Afghanistan Scenario)

MNE 4: February / March 2006 (added FIN and SWE)
⇨Effects-Based Operations(Afghanistan Scenario)

MNE 5: Spring 2008/Spring 2009
⇨ Comprehensive Approach (African Scenario) + Effects-Based Approach to Multinational Operations (military portion)

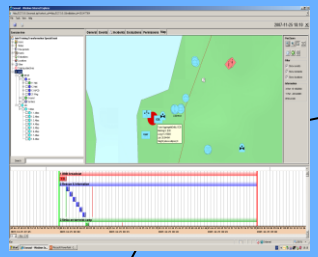
MNE 5 Partners
- Canada
- Finland
- France
- Germany
- Sweden
- United Kingdom
- United States
- NATO ACT

MNE 5 Participants
- Australia
- Austria
- Denmark
- Spain

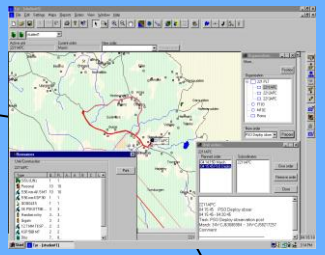
MNE 5 Observers
- Czech Republic
- Greece
- Hungary
- Japan
- Poland
- South Korea
- Singapore
- European Union

C2 and Training interoperability

Exercise Management System (EXONAUT)



National simulation systems (TYR, JCATS, GESI, TCT)



Voice IP

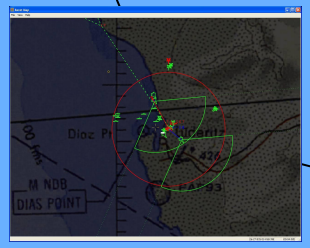
VTC

Exercise Control

Email

POT

Web

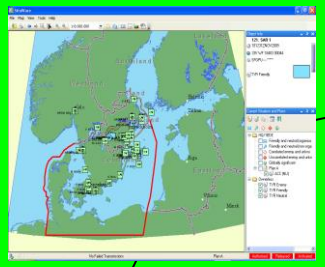


Air & Combat operations simulation (ASCOT)

Radio and Voice simulation (PLEXCOM)

P2SN SYSTEMS FEDERATION

Common Operational Picture (SITAWARE)



Information Management Portal (SHAREPOINT)

Voice IP

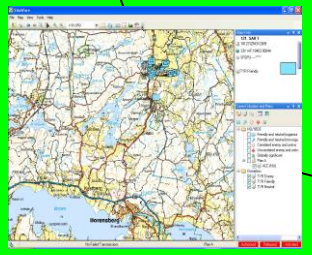
VTC

Training Audience

Email

POT

Web



Tactical Situaiton Awareness (SLB)

Map Tool (Arc Explorer, Google Earth)

The VIKING concept

- **The premier Multinational and Comprehensive Approach exercise in the world**
- **Washington Summit NATO 50th Anniversary VIKING concept demonstration 1999 – a Swedish / U.S. initiative (MoU since 1998)**
- **Executed in VIKING 99, 01, 03, 05, 08**
- **Based on the Persistent Partner Simulation Network Concept**
- **Political impact & flagship for the Swedish Armed Forces**
- **Important in building Partnership Capacity before deployment in operations**
- **Provides a wider "Network" building**

MAIN PARTNERS 1999-2008:

SWEDISH ARMED FORCES
HEADQUARTERS

The VIKING 08

The fifth VIKING Computer Assisted Command Post Exercise based on the Partner Training & Simulation Network Concept

2 000 participants from 31 nations and 47 organizations

Main Training Audience on Land, Maritime, Air and Infooperations Component Command level

NATO procedures

Crises Response scenario (BOGALAND) including NATO- and EU-led operations

VIKING 11

- Execution 4-15 April 2011
- Force HQ concept (mission tailored)
- Swedish main Training Audience – one of our readiness HQ's
- Downsize Exercise Control – "few to train many"
- Increase Concept Development & Experimentation
- Develop and increase Comprehensive Approach
- Civilian Partner (Folke Bernadotte Academy) to co-chair
- Increase Partner support through planning phase
- Core Planning Team to be formed at the Joint Training Centre
- Increase participation from Central Asia
- Open for identified Partners (by SWE&US), not only PfP – like NATO contact nations, African Union and EASBRIG
- Increase the use of designed ADL support

The Swedish Joint National Training Capability Demonstration

CATS TYR

Joint level constructive simulator. Wargaming for Combined Joint Operations and Other Operations Than War

"For distributed training, connect training facilities at various sites. Aiming to create a system available for joint exercises on a daily basis".

Filter

CATS MRM

Multi Resolution Layer which connect the aggregated model and the high resolution models

ASCOT

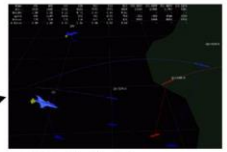
Advanced Simulation Combat Operations Trainer. Battle Management and C 2 Live Virtual Constructive Synthetic environment generation for Air, Ground and Maritime domains.

Google Earth Pro Adapter

Scenario Viewer and Common Operational Picture through Google Earth.

PLEXComm

PLEXComm Suite is a high fidelity radio simulation



DMOCS

Distributed Mission Operators Control System, Prototype concept for Exercise Control

Demo C2 ADS

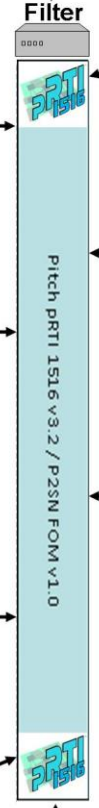
Command & Control Air Defence System
Site: Air Defence School, Uppsala

GBAD RBS 70

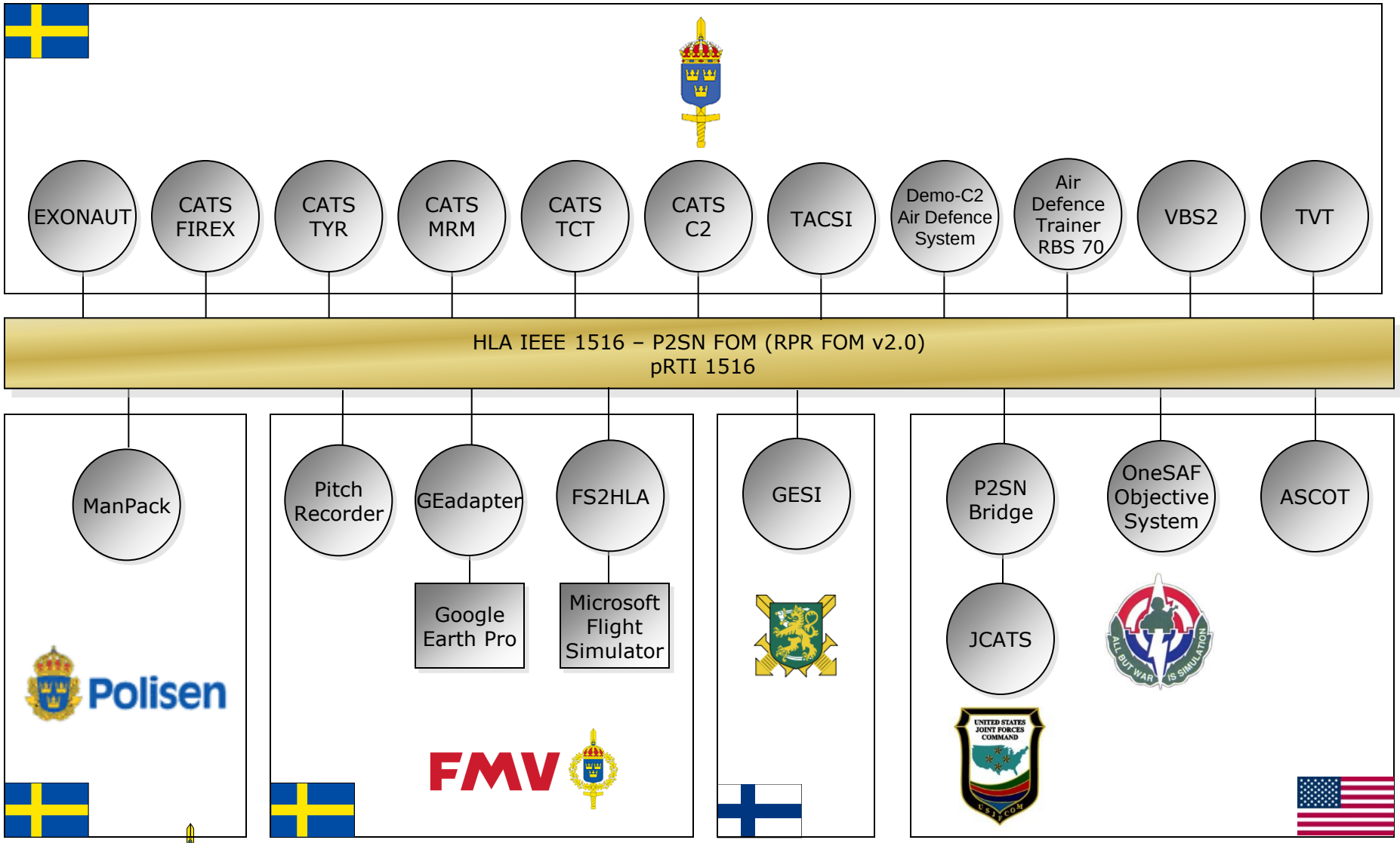
Ground Based Air Defence
Surface to Air Missile simulator
Site: Air Defence Combat Training Centre, Halmstad

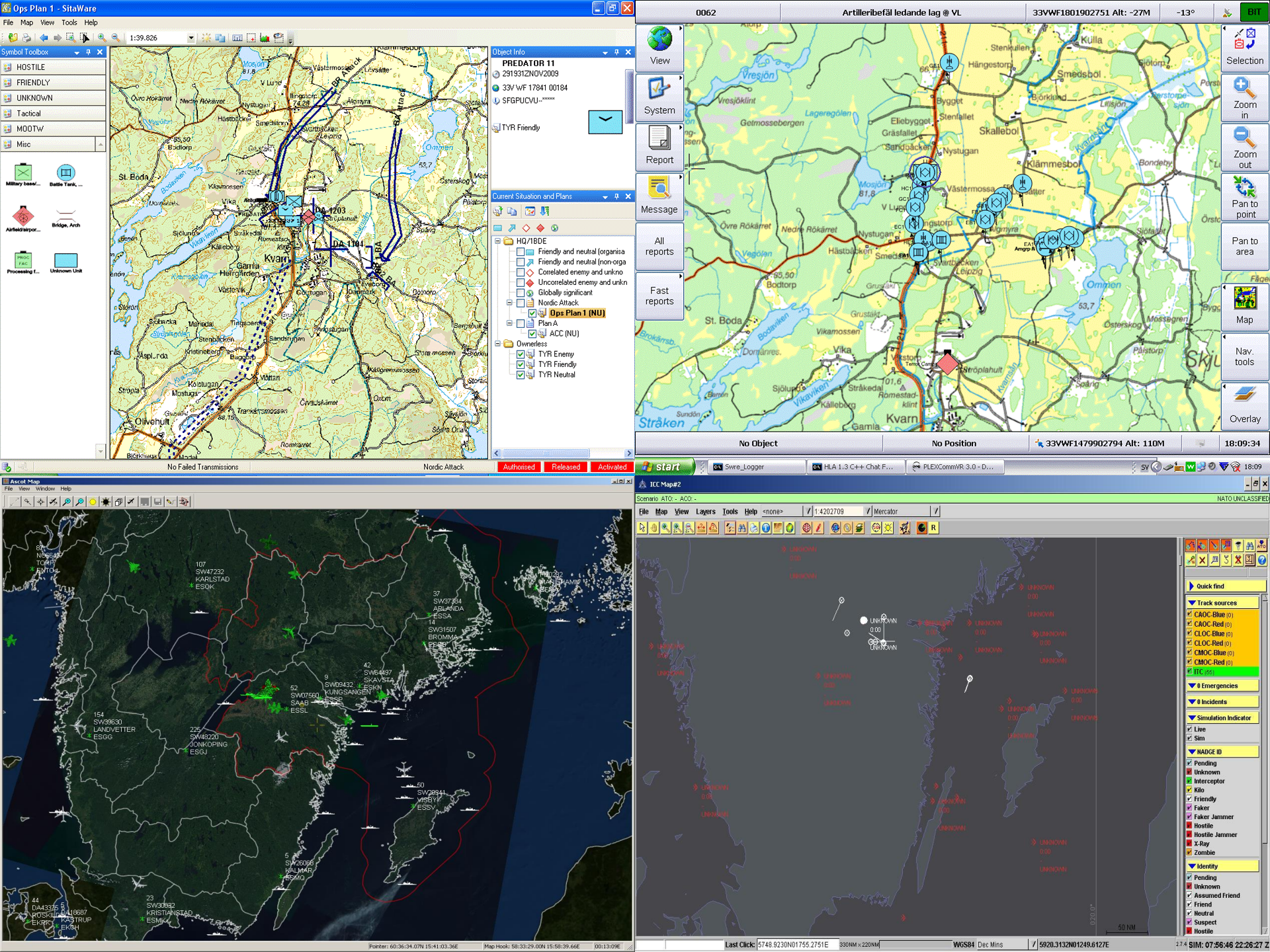
T3SIM

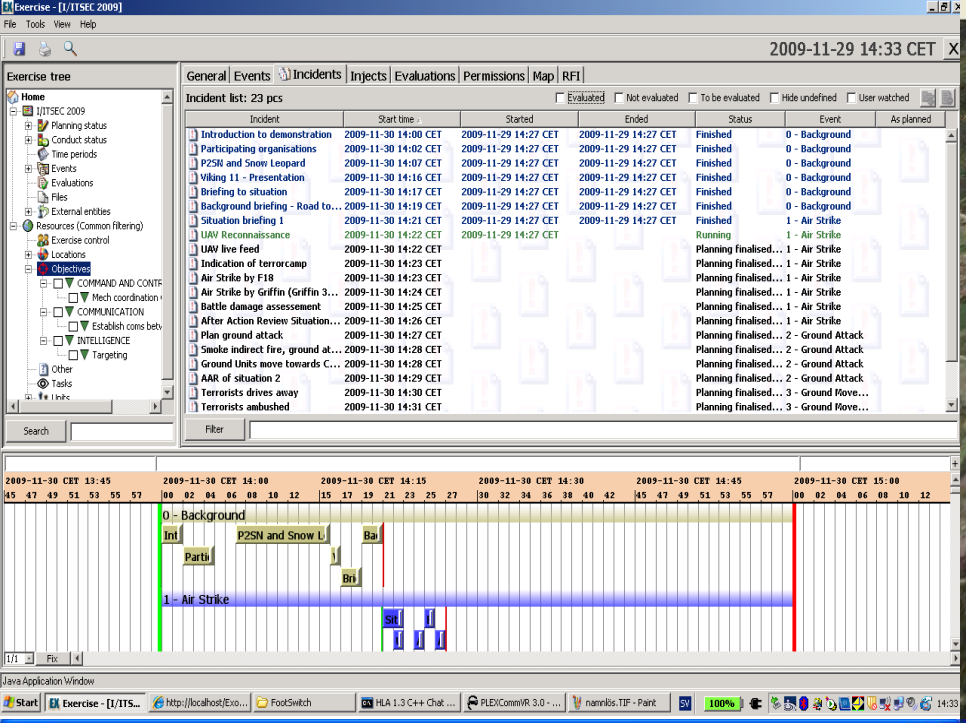
Virtual Fighter/attack aircraft simulator.
Live Site: Swedish Defence Research Agency & Air Force Air Combat Simulation Centre, Kista.

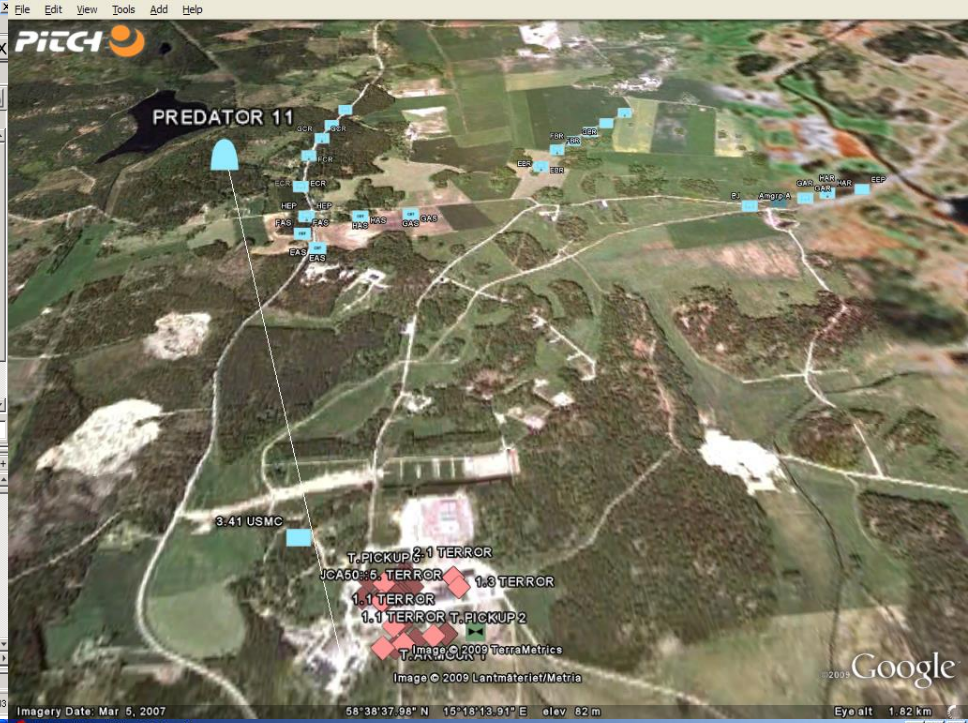


ITEC 08 Federation Design

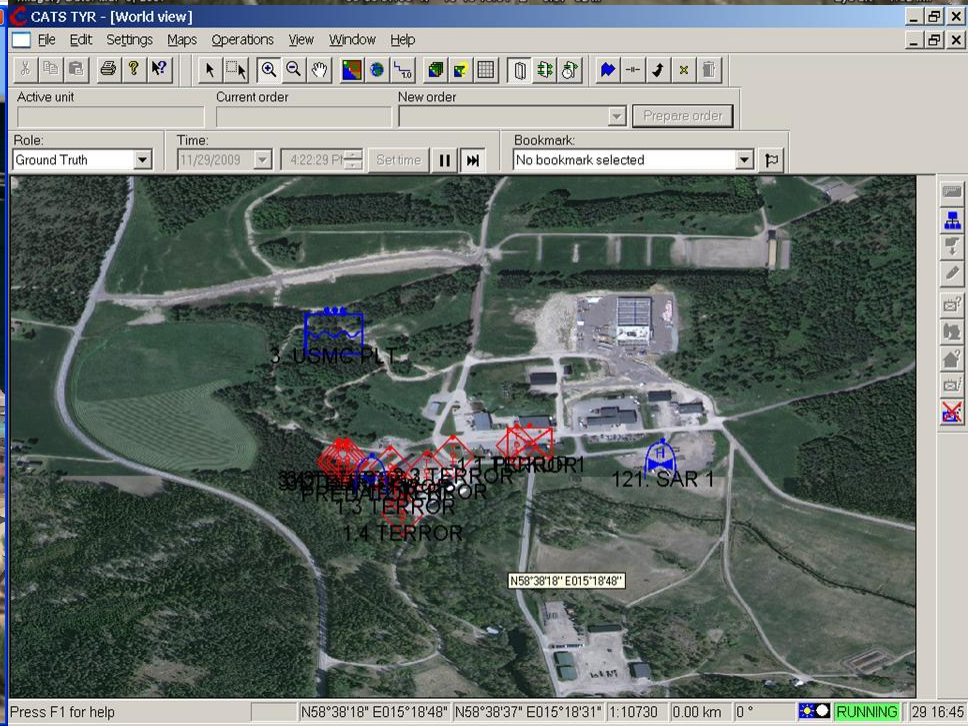



Ops Plan 1 - SitaWare
File Map View Tools Help
Symbol Toolbox
HOSTILE
FRIENDLY
UNKNOWN
Tactical
MOOTW
Misc
Object Info
PREDATOR 11
291931ZNOV2009
33V WF 17841 00184
SFGPUCVU--*****
TYR Friendly
Current Situation and Plans
HQ/18DE
Friendly and neutral (organisa
Friendly and neutral (non-orga
Correlated enemy and unkno
Uncorrelated enemy and unkn
Globally significant
Nordic Attack
Ops Plan 1 (NU)
Plan A
ACC (NU)
Ownerless
TYR Enemy
TYR Friendly
TYR Neutral
No Failed Transmissions
Nordic Attack
Authorised
Released
Activated
0062
Artilleribefäl ledande lag @ VL
33VWF1801902751 Alt: -27M
-13°
BIT
View
System
Report
Message
All reports
Fast reports
Selection
Zoom in
Zoom out
Pan to point
Pan to area
Map
Nav. tools
Overlay
No Object
No Position
33VWF1479902794 Alt: 110M
18:09:34
start
Swre_Logger
HLA 1.3 C++ Chat F...
PLEXCommVR 3.0 - D...
18:09
Ascot Map
File View Window Help
ICC Map#2
Scenario: ATO: - ACO: -
NATO UNCLASSIFIED
File Map View Layers Tools Help
Quick find
Track sources
CAOC-Blue (0)
CAOC-Red (0)
CLOC-Blue (0)
CLOC-Red (0)
CMOC-Blue (0)
CMOC-Red (0)
ITC (55)
0 Emergencies
0 Incidents
Simulation Indicator
Live
Sim
NADGE ID
Pending
Unknown
Interceptor
Kilo
Friendly
Faker
Faker Jammer
Hostile
Hostile Jammer
X-Ray
Zombie
Identity
Pending
Unknown
Assumed Friend
Friend
Neutral
Suspect
Hostile
Last Click:
WGS84 Dec Mins
SIM: 07:56:46 22:26:27 Z


Exercise - [I/ITSEC 2009]
File Tools View Help
2009-11-29 14:33 CET
Exercise tree
Home
I/ITSEC 2009
Planning status
Conduct status
Time periods
Events
Evaluations
Files
External entities
Resources (Common filtering)
Exercise control
Locations
Objectives
COMMAND AND CONTR
Mech coordination
COMMUNICATION
Establish coms betv
INTELLIGENCE
Targeting
Other
Tasks
Units
Search
General Events Incidents Injects Evaluations Permissions Map RFI
Incident list: 23 pcs
Evaluated Not evaluated To be evaluated Hide undefined User watched
Incident | Start time | Started | Ended | Status | Event | As planned
Introduction to demonstration | 2009-11-30 14:00 CET | 2009-11-29 14:27 CET | 2009-11-29 14:27 CET | Finished | 0 - Background
Participating organisations | 2009-11-30 14:02 CET | 2009-11-29 14:27 CET | 2009-11-29 14:27 CET | Finished | 0 - Background
P2SN and Snow Leopard | 2009-11-30 14:07 CET | 2009-11-29 14:27 CET | 2009-11-29 14:27 CET | Finished | 0 - Background
Viking 11 - Presentation | 2009-11-30 14:16 CET | 2009-11-29 14:27 CET | 2009-11-29 14:27 CET | Finished | 0 - Background
Briefing to situation | 2009-11-30 14:17 CET | 2009-11-29 14:27 CET | 2009-11-29 14:27 CET | Finished | 0 - Background
Background briefing - Road to... | 2009-11-30 14:19 CET | 2009-11-29 14:27 CET | 2009-11-29 14:27 CET | Finished | 0 - Background
Situation briefing 1 | 2009-11-30 14:21 CET | 2009-11-29 14:27 CET | 2009-11-29 14:27 CET | Finished | 1 - Air Strike
UAV Reconnaissance | 2009-11-30 14:22 CET | 2009-11-29 14:27 CET | | Running | 1 - Air Strike
UAV live feed | 2009-11-30 14:22 CET | | | Planning finalised... | 1 - Air Strike
Indication of terrorcamp | 2009-11-30 14:23 CET | | | Planning finalised... | 1 - Air Strike
Air Strike by F18 | 2009-11-30 14:23 CET | | | Planning finalised... | 1 - Air Strike
Air Strike by Griffin (Griffin 3... | 2009-11-30 14:24 CET | | | Planning finalised... | 1 - Air Strike
Battle damage assessement | 2009-11-30 14:25 CET | | | Planning finalised... | 1 - Air Strike
After Action Review Situation... | 2009-11-30 14:26 CET | | | Planning finalised... | 1 - Air Strike
Plan ground attack | 2009-11-30 14:27 CET | | | Planning finalised... | 2 - Ground Attack
Smoke indirect fire, ground at... | 2009-11-30 14:28 CET | | | Planning finalised... | 2 - Ground Attack
Ground Units move towards C... | 2009-11-30 14:28 CET | | | Planning finalised... | 2 - Ground Attack
AAR of situation 2 | 2009-11-30 14:29 CET | | | Planning finalised... | 2 - Ground Attack
Terrorists drives away | 2009-11-30 14:30 CET | | | Planning finalised... | 3 - Ground Move...
Terrorists ambushed | 2009-11-30 14:31 CET | | | Planning finalised... | 3 - Ground Move...
Filter
2009-11-30 CET 13:45
2009-11-30 CET 14:00
2009-11-30 CET 14:15
2009-11-30 CET 14:30
2009-11-30 CET 14:45
2009-11-30 CET 15:00
0 - Background
1 - Air Strike
Java Application Window

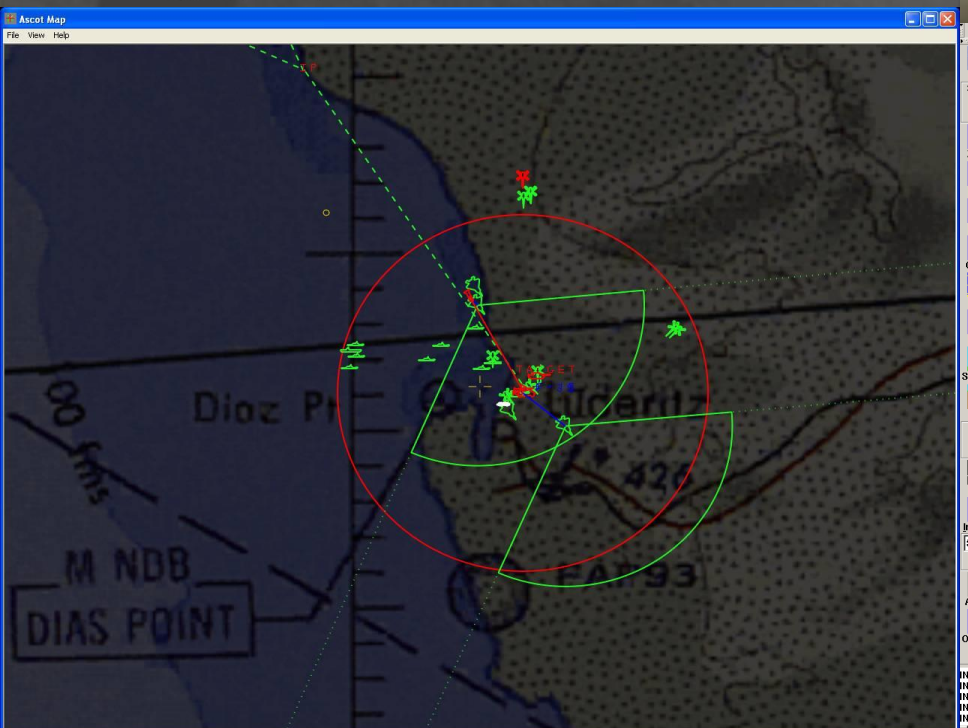

File Edit View Tools Add Help
PITCH
PREDATOR 11
3.41 USMC
T.PICKUP 2
1.3 TERROR
1.1 TERROR
1.1 TERROR T.PICKUP 2
Image © 2009 TerraMetrics
Image © 2009 Lantmäteriet/Metria
Google
Imagery Date: Mar 5, 2007
58°38'37.98" N 15°16'13.91" E elev 82 m
Eye alt 1.82 km

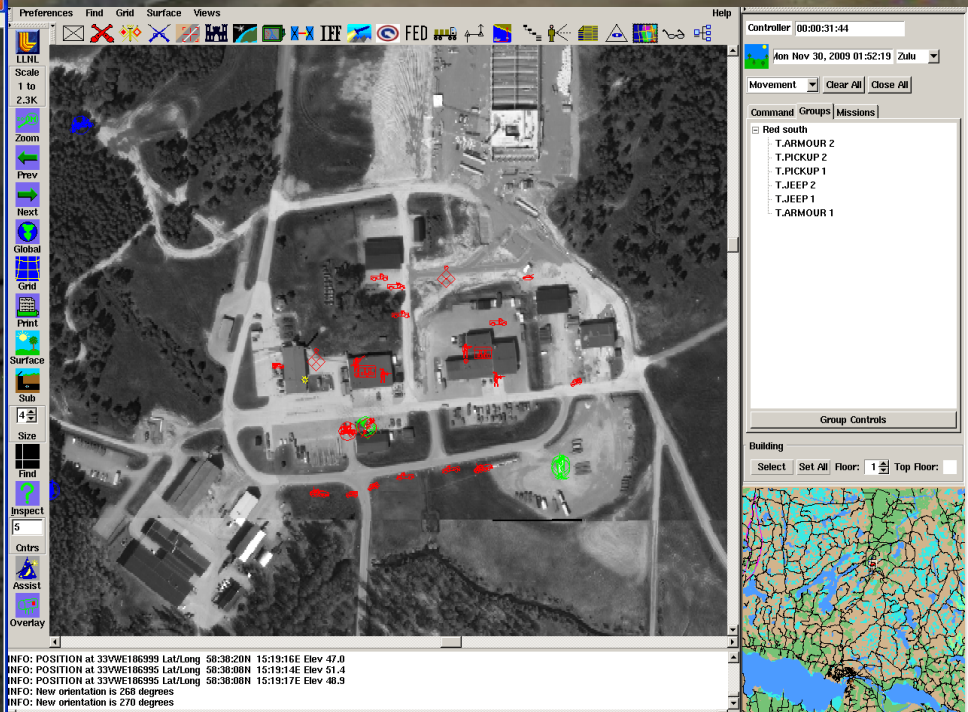
Cats3D
Civilian 2
7. CBRN
8. RECONSTR
111. AH 1
Red Cross 2
Red Cross 1
Ambulance 3
Police 2
Civilian 4
Ambulance 2
Civilian 3
45. MEDIC
US AID
BAE SYSTEMS


CATS TYR - [World view]
File Edit Settings Maps Operations View Window Help
Active unit
Current order
New order
Prepare order
Role:
Ground Truth
Time:
11/29/2009
4:22:29 PM
Set time
Bookmark:
No bookmark selected
3. USMC PLT
121. SAR 1
1.4 TERROR
N58°38'18" E015°18'48"
Press F1 for help
N58°38'18" E015°18'48"
N58°38'37" E015°18'31"
1:10730
0.00 km
0 °
RUNNING
29 16:45

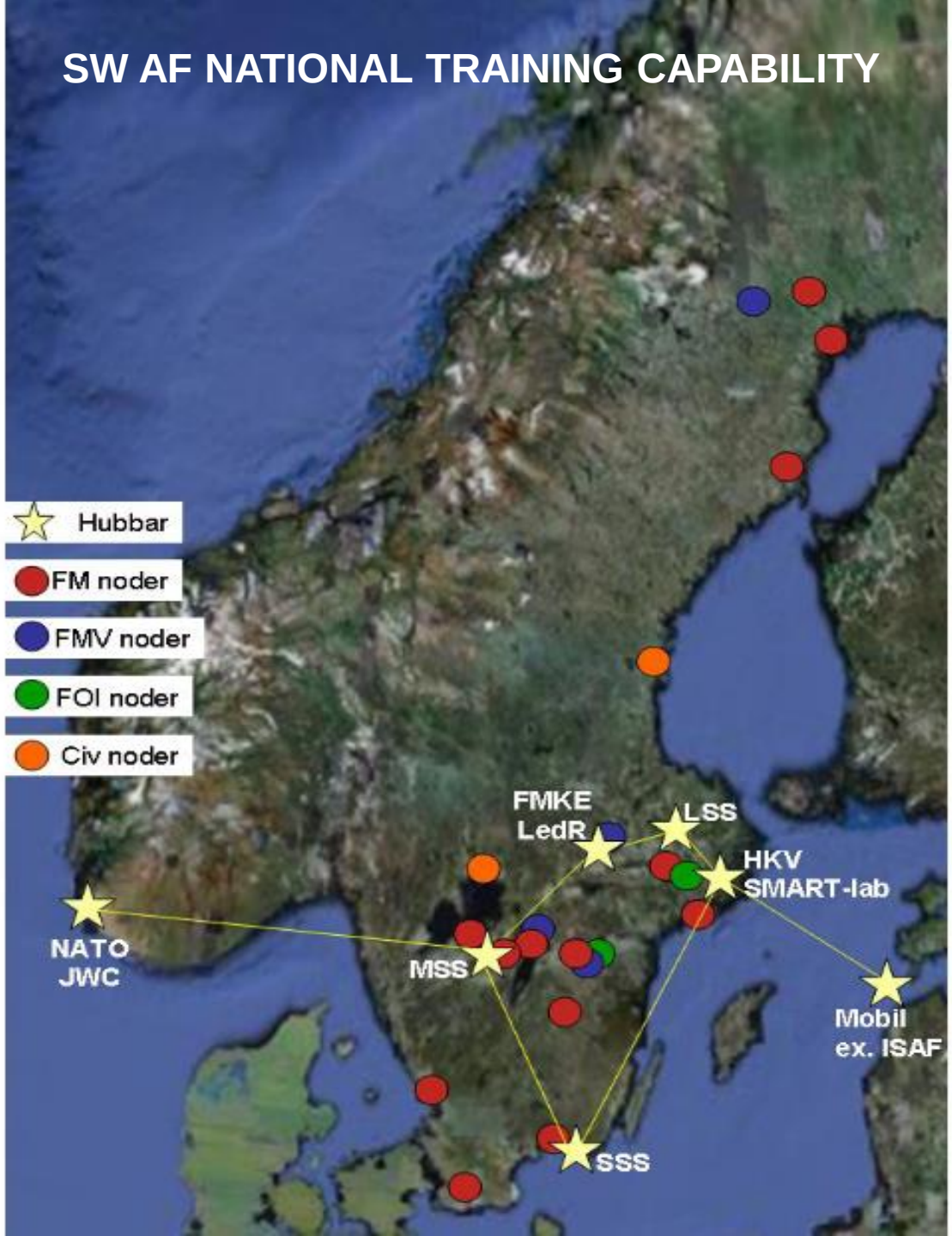
Fuel
Health
Alt. 2007ft
Set 2000
Speed 60kts
Set 52
Position
17899995
L O C K E D
7.55x
WHITE - HOT
Auto Contrast On
Brightness
Contrast
TPOS 18210007
TALT 0
TRNG 2340
7:32:56
Wed, Nov 18

VBS2


Ascot Map
File View Help
Dioz Pt
M NDB
DIAS POINT

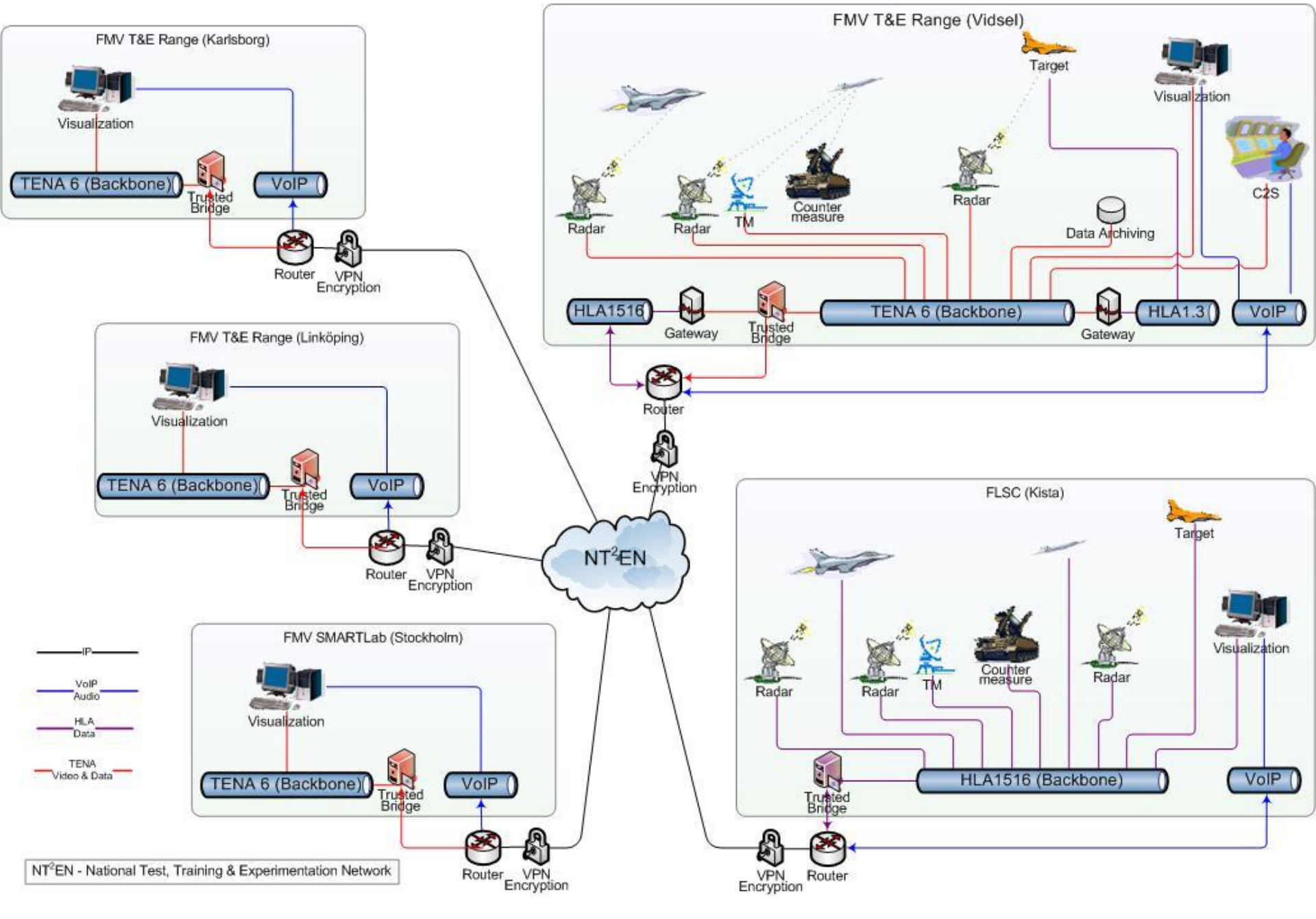

Preferences Find Grid Surface Views Help
LLNL
Scale
1 to
2.3K
Zoom
Prev
Next
Global
Grid
Print
Surface
Sub
Size
Find
Inspect
Cntrs
Assist
Overlay
INFO: POSITION at 33VWE186999 Lat/Long 58:38:20N 15:19:16E Elev 47.0
INFO: POSITION at 33VWE186995 Lat/Long 58:38:08N 15:19:14E Elev 51.4
INFO: POSITION at 33VWE186995 Lat/Long 58:38:08N 15:19:17E Elev 48.9
INFO: New orientation is 268 degrees
INFO: New orientation is 270 degrees
Controller 00:00:31:44
Mon Nov 30, 2009 01:52:19 Zulu
Movement
Clear All
Close All
Command Groups Missions
Red south
T.ARMOUR 2
T.PICKUP 2
T.PICKUP 1
T.JEEP 2
T.JEEP 1
T.ARMOUR 1
Group Controls
Building
Select
Set All
Floor:
Top Floor:

SW AF NATIONAL TRAINING CAPABILITY



Distributed, Mixed (LVC) Missile Test Scenario

Configuration overview



List of Ten Command & Control challenges :

1. To meet Warfighters operational requirements of tomorrow
2. Mission rehearsal and planning
3. Available in Theatre
4. Mobile platforms
5. Interoperability and Standardised languages
6. Federations and integration of training and C2 systems
7. Information sharing – alliance and partners
8. A Comprehensive Approach – Civilian dimension
9. Persistent low-cost concept –Multinational Capabilities
10. Multilevel security